

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property
Organization
International Bureau



10/521921



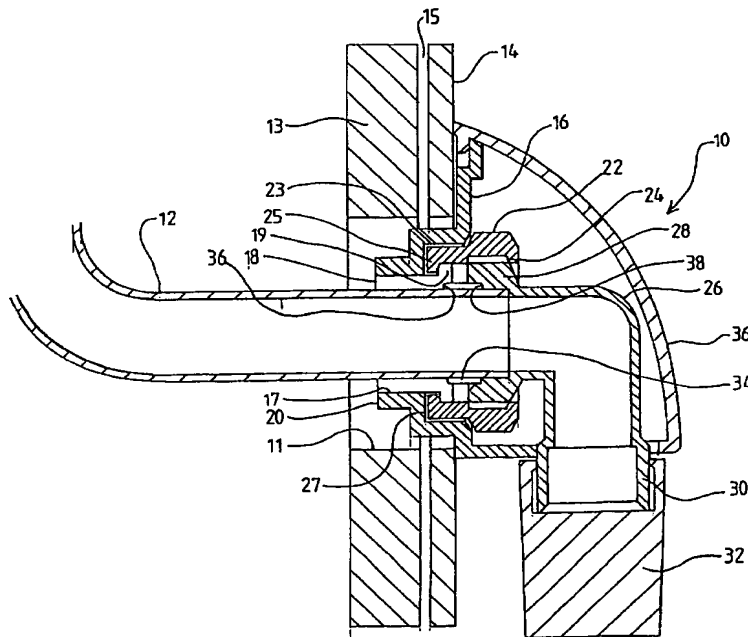
(43) International Publication Date
29 January 2004 (29.01.2004)

PCT

(10) International Publication Number
WO 2004/009915 A1

- (51) International Patent Classification⁷: E03C 1/02
- (21) International Application Number:
PCT/GB2003/001928
- (22) International Filing Date: 2 May 2003 (02.05.2003)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
0216898.7 20 July 2002 (20.07.2002) GB
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- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
- Published:
— with international search report
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: FLUID CONNECTION ASSEMBLY



(57) Abstract: A fluid connection assembly (10) for connection to a fluid supply member (12) extending through a panel (13) from a rear to a front surface of the panel, comprises a connection member (26) engageable with the fluid supply member at the front surface of the panel; and connecting means (22) operable from in front of the panel to connect the fluid supply member to the outlet member in a fluid-tight manner. The connection member may be a shower outlet elbow for connection of a shower hose.

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Title: Fluid Connection Assembly

Description of Invention

The invention relates to a fluid connection assembly. The invention has been devised particularly but not exclusively in relation to a fluid outlet assembly intended for connection of a flexible shower hose, to lead to a shower head.

It is usual in shower installations, e.g. in domestic bath/shower rooms, to dispose fixed pipework, by which water is conveyed to the shower, behind a concealing panel with only the control(s) visible at the front surface of the panel. Such pipework may comprise hot and cold water supply pipes leading to a mixer valve controlling the shower and a single pipe leading from the mixer valve to the outlet assembly, which pipe usually protrudes through the panel. The outlet assembly normally comprises an outlet elbow, which connects to the supply pipe by a compression fitting. However, the compression fitting is usually disposed within a space behind the panel and access to the space is needed in order to enable secure connection of the outlet elbow to the supply pipe.

One problem with such an arrangement is that the requirement for such access is inconvenient, both during first installation of a shower and particularly if for any reason the outlet elbow needs servicing or subsequent replacement. A part of the panel may have to be removed to enable access to the compression fitting, which is particularly inconvenient if there are tiles covering the panel. The same difficulties can be encountered in situations other than shower installations.

It is therefore an object of the present invention to provide a fluid connection assembly which overcomes the aforementioned installation problems.

According to the present invention, there is provided a fluid connection assembly for connection to a fluid supply member extending through a panel from a rear to a front surface of the panel, comprising:-

a connection member engageable with the fluid supply member at the front surface of the panel; and

connecting means operable from in front of the panel to connect the fluid supply member to the connection member in a fluid-tight manner.

The assembly preferably comprises a support member adapted to lie against the front surface of the panel.

The connecting means is preferably a compression fitting and preferably comprises a sealing element deformable to establish a seal between the fluid supply member and the connection member.

There may be a screw-threaded element adapted to engage with a complementary threaded portion of the connection member. The screw-threaded element may be held captive by a formation on the support member.

There may also be provided a cover member adapted to engage with the assembly to conceal the assembly therebeneath.

The cover member may engage with the assembly by a snap-fit with the assembly.

The connection member may have a portion adapted to connect to a flexible shower hose. The connection member may be an outlet elbow.

The invention will now be described by way of example with reference to the accompanying drawings, of which:

Figure 1 is a side cross-sectional view of a first embodiment of fluid connection assembly in accordance with the invention;

Figure 2 is a view as Figure 1 of a further embodiment of fluid connection assembly in accordance with the invention;

Figure 3 is a view of a yet further embodiment of the invention.

Referring firstly to Figure 1 of the drawings, there is shown a first embodiment of fluid connection assembly 10 in accordance with the present invention. There is a fluid supply member in the form of a pipe 12, which extends from, for example, a shower mixer valve (not shown). The pipe 12 passes through an aperture 11 in a panel 13, the panel 13 having a covering in the form of, for example, a tiled surface 14 bonded to the front surface of the panel 13 by an adhesive 15. Lying against the tiled surface 14, and reaching into the aperture 11, is a support member in the form of a support plate 16, e.g. of a plastics material. The support plate 16 has a cylindrical recess 23 ending in a radial face 27, followed by a concentric sleeve 20 with an aperture 17. Fixed within the sleeve 20 is a further sleeve 18, within which the pipe 12 is a sliding fit, the sleeve 18 ending at an outwardly extending flange 19 spaced from the radial wall 27.

Disposed around the pipe 12 and extending into the recess 23 on the support plate 16 is a screw-threaded element in the form of a nut 22 with an inwardly extending flange 25 at one end. The flange 25 is captively received between the radial face 27 and the flange 19, so that the nut 22 cannot move any substantial distance length-wise of the pipe 12, but can rotate therearound. The surface of the nut 22, outside the recess 23 is, for example, hexagon-shaped for engagement with a spanner to allow a user to rotate the nut 22. The nut 22 is internally threaded at this end.

A fluid connection member in the form of an elbow 26, having an externally threaded portion 28, is engaged with the nut 22, thereby connecting the interior of the pipe 12 to the interior of the elbow 26. A further threaded portion 30 is provided at the free end of the elbow 26 for threaded engagement with a connector 32, which connects to a flexible pipe leading to a shower head (not shown).

Disposed between the sleeve 18 and the elbow 26 is a sealing means provided by an annular sealing member or "olive" 34. The olive 34 engages

between facing annular recesses 36, 38 on the flange 19 and the threaded portion 28, respectively. The flange 19, nut 22 and the threaded portion 28, together with the olive 34 provide what is known in the art as a compression fitting.

When installing the fluid outlet assembly to a pipe 12, the pipe 12 must extend through the panel 13 and preferably protrude slightly from the tiled surface 14. The support plate 16, including the nut 22, which is engaged between the flange 19 and the radial face 27, is placed over the pipe 12 so that the sleeve 18 receives the pipe 12. The olive 34 is then placed over the pipe 12 until it abuts the flange 19. The elbow 26 is partially threaded into the nut 22 and rotated until the threaded portion 30 is pointing in a desired direction, e.g. normally downwards for connection by connector 32 to a flexible pipe of a shower head (not shown). The nut 22 is tightened so as to collapse the olive 34 between the recesses 36, 38. The collapsed olive 34 provides a fluid-tight seal between the pipe 12 and the elbow 26, such that a fluid, e.g. hot or cold water, can pass through the pipe 12 and into the elbow 26 and not escape.

A cover member in the form of a cover plate 36, e.g. of a plastics material, is snap-fitted to the support plate 16 to conceal the assembly therebeneath.

In the above description the support plate 16 and the sleeve 18 are of a compatible metal alloy, e.g. brass, allowing them to be welded, soldered or bonded to each another, thereby fixing the sleeve 18 within the sleeve 20 of support plate 16. The pipe 12 would be of copper, whilst the nut 22 and elbow 26 are conventionally manufactured from brass. The olive 34 is also of a copper based alloy, thereby allowing it to deform more easily and hence provide an adequate seal between the sleeve 18 and the elbow 26. However, it must be understood that other materials may be used for the components of the outlet assembly as long as they have physical properties capable of being utilised in the present invention.

Referring now to Figure 2 of the drawings, this shows, in a view corresponding to Figure 1, a further embodiment of the invention. In this embodiment, a pipe 112 extends through an aperture 111 in a panel 113. At the front surface of the panel 113 there is provided a support member in the form of a support plate 116, secured to the panel 113 by screws passing through countersunk apertures 116a in the support plate. The support plate 116 has a part 126 which extends forwardly therefrom, surrounding the pipe 112 and constituting a connection member. The connection member 126 is internally screw-threaded at 126a, for engagement by a complementary external screw-thread on a sleeve part 122a of a nut 122. An olive 134 surrounds the pipe 112, and is engaged between facing annular recesses 136, 138 in the support plate 116 and sleeve part 122a, respectively, so that tightening of the nut 122 causes the olive to be compressed and establish a fluid-tight connection between the pipe 112 and the support plate 116.

The portion 126 of the support plate which forms the connection member is provided on its external surface with an annular land 127. A fitting of any desired type, e.g. a shower inlet fitting, may be fitted over the portion 126 and secured by, for example, a grub screw or screws engaging the land 127. Suitable sealing members, e.g. O-rings, may be disposed in known manner to provide a fluid-tight connection between the fitting and the portion 126.

Referring finally now to Figure 3 of the drawings, this shows a further embodiment of the invention in which again there is a pipe 212 extending through an aperture in a panel 213. There is also a support plate 216 secured to the front surface of the panel 213 by screws shown at 216a. The support plate 216 has a forwardly extending externally screw-threaded spigot portion 218 which closely surrounds the pipe 212.

Engaged with the screw-thread on the exterior of the spigot portion 218 there is a correspondingly internally screw-threaded end portion 226a of a connection member 226. An olive 234 is received between annular recesses in

the end of the spigot portion 218 and in the interior of the connection member 226, and is deformed into engagement with the pipe and other components by tightening the screw-threaded connection between the connection member 226 and the spigot portion 218. Thus a fluid-tight connection is provided between the connection member 226 and the pipe 212.

The connection member 226 is externally screw-threaded at 226b, for engagement by a fitting such as a shower head for example. A flat seal may be disposed between such a fitting and the free end of the connection member 226.

It will be appreciated that in all the embodiments of the invention above described a fluid tight connection is achieved between the connection member and the fluid supply pipe without requiring any access to the rear of the panel through which the pipe extends. This considerably simplifies the installation of showers, for example, utilising such assemblies.

In the present specification "comprises" means "includes or consists of" and "comprising" means "including or consisting of".

The features disclosed in the foregoing description, or the following claims, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, as appropriate, may, separately, or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

CLAIMS

1. A fluid connection assembly for connection to a fluid supply member extending through a panel from a rear to a front surface of the panel, comprising:-

a connection member engageable with the fluid supply member at the front surface of the panel; and

connecting means operable from in front of the panel to connect the fluid supply member to the connection member in a fluid-tight manner.

2. A fluid connection assembly according to Claim 1 further comprising a support member adapted to lie against the front surface of the panel.

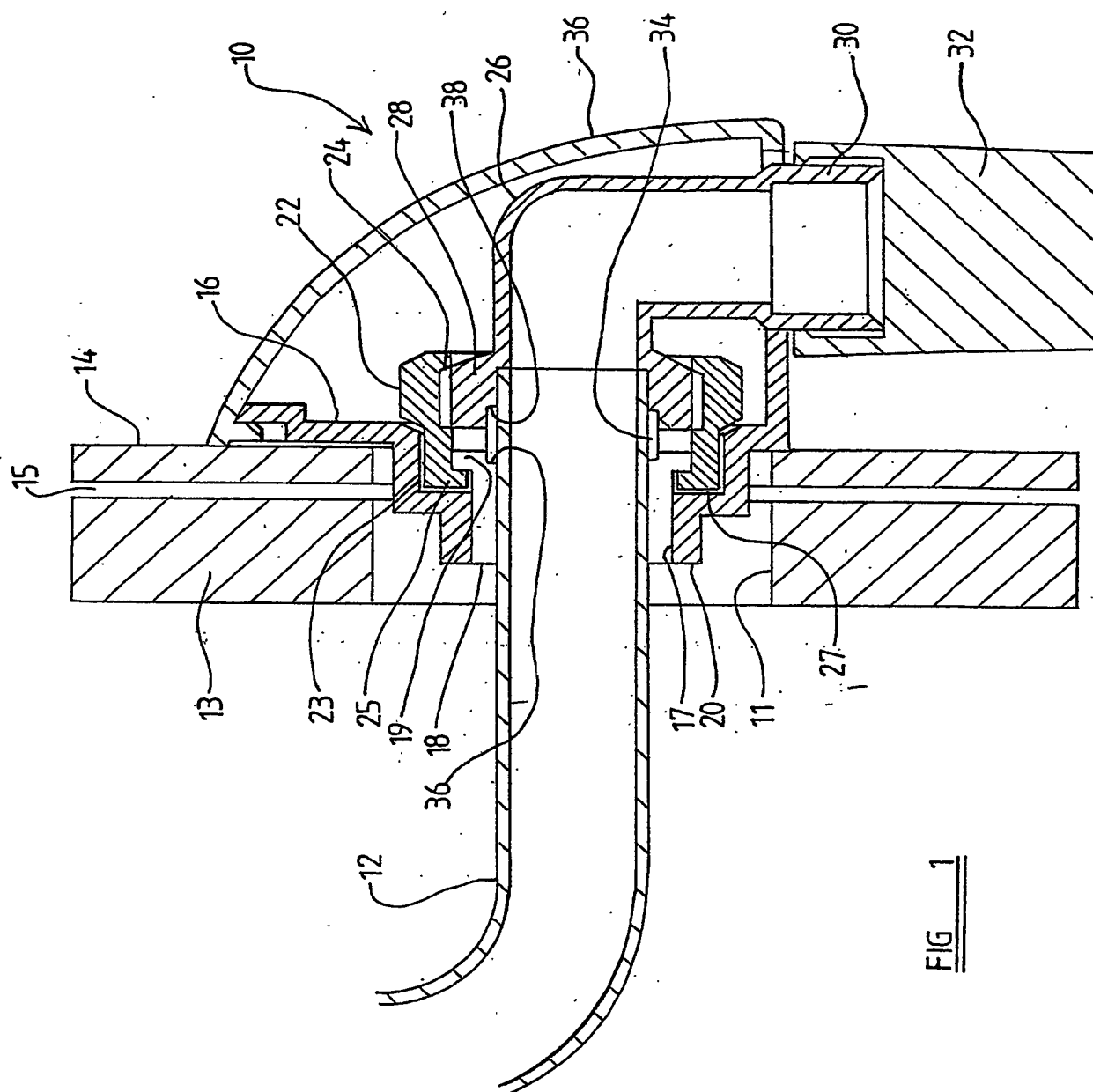
3. A fluid connection assembly according to Claim 1 or 2 wherein the connecting means is a compression fitting.

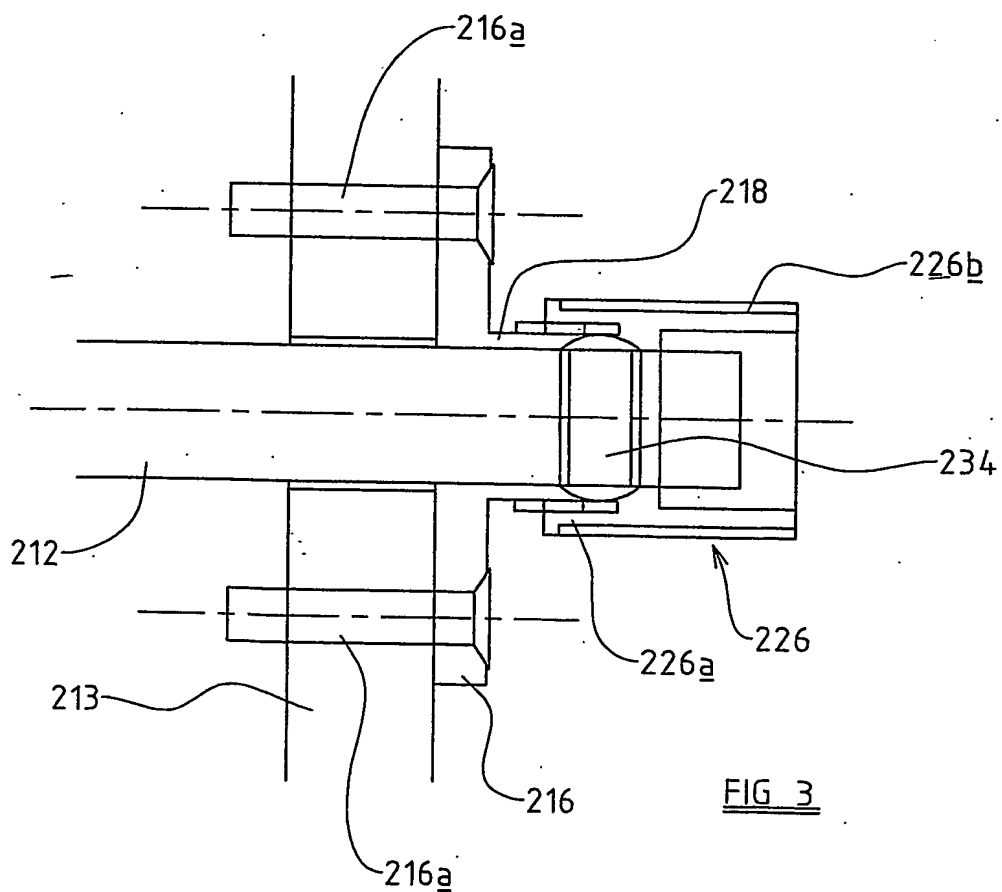
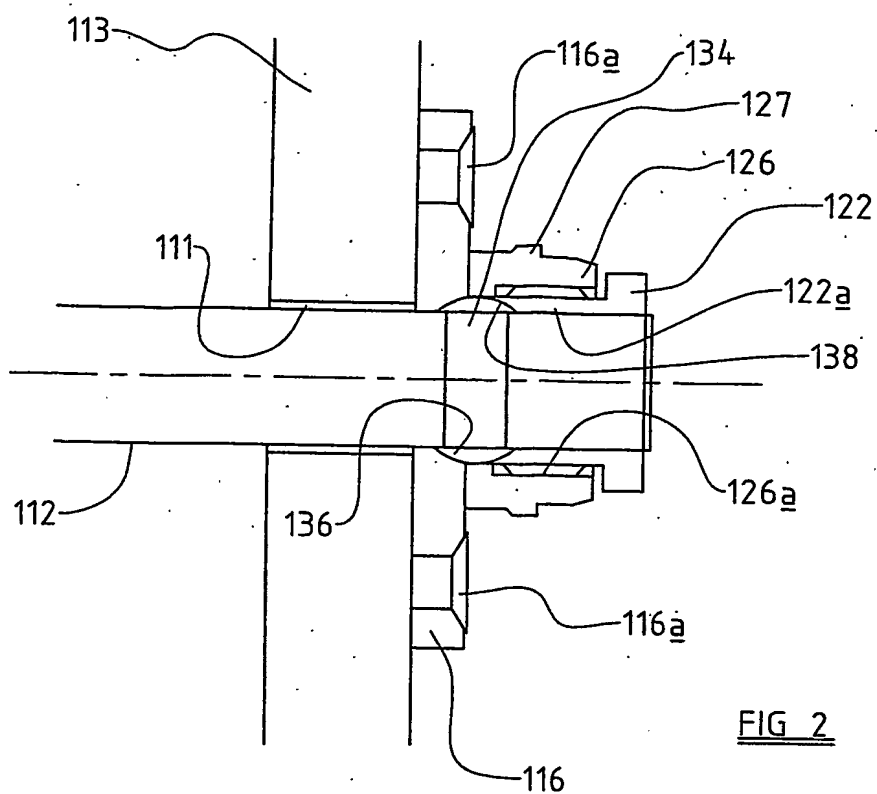
4. A fluid connection assembly according to claim 3 wherein the compression fitting comprises a sealing element deformable to establish a seal between the fluid supply member and the connection member.

5. A fluid connection assembly according to any preceding claim wherein the assembly comprises a screw-threaded element adapted to engage with a complementary threaded portion of the connection member.

6. A fluid connection assembly according to Claim 5 as appendant directly or indirectly to Claim 2 wherein the screw-threaded element is held captive by a formation on the support member.

7. A fluid connection assembly according to Claim 5 as appendant directly or indirectly to Claim 2 wherein the connection member is afforded by a portion of the support member.
8. A fluid connection assembly according to any of Claims 1 to 4 wherein the connection member is screw-threadedly connected to the support member.
9. A fluid connection assembly according to any preceding claim wherein the connection member has a portion adapted to connect to a shower hose.
10. A fluid connection assembly according to any of Claims 1 to 8 wherein the connection member has a portion adapted to connect to a shower head.
11. A fluid outlet assembly according to any preceding claim wherein the connection member is an outlet elbow.
12. A fluid connection assembly according to any preceding claim wherein a cover member is provided, adapted to engage with the assembly to conceal the assembly therebeneath.
13. A fluid connection assembly according to Claim 12 wherein the cover member engages with the assembly by a snap-fit with the assembly.
14. A fluid outlet assembly substantially as hereinbefore described with reference to the accompanying drawings.
15. Any novel feature or novel combination of features described herein and/or in the accompanying drawings.





INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 03/01928

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 E03C1/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 E03C F16L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the International search (name of data base and, where practical, search terms used)

EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|------------|---|-----------------------|
| X | US 6 192 529 B1 (MITCHELL GERALD M ET AL) 27 February 2001 (2001-02-27) column 1, line 60 - line 64; figure 4 column 2, line 45 -column 3, line 36 | 1-3, 5-10,12 |
| X | WO 92 11484 A (DEPEX AB) 9 July 1992 (1992-07-09) abstract; figures 1,2 page 3, line 33 -page 7, line 8 | 1-4,12 |
| X | DE 195 20 905 C (LINDNER ARMATUREN GMBH) 22 August 1996 (1996-08-22) the whole document | 1-3,7 |
| X | US 1 502 154 A (PHILIP MUELLER ET AL) 22 July 1924 (1924-07-22) the whole document | 1,3,4 |
| | -/-- | |

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

* Special categories of cited documents:

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *Z* document member of the same patent family

Date of the actual completion of the international search

14 August 2003

Date of mailing of the international search report

28/08/2003

Name and mailing address of the ISA

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Flygare, E

INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 03/01928

| C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT | | |
|--|--|-----------------------|
| Category * | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| X | DE 38 07 846 A (GROHE ARMATUREN FRIEDRICH) | 1, 3 |
| A | 21 September 1989 (1989-09-21) the whole document ----- | 11 |

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB 03/01928

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☒ Claims Nos.: 14, 15
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
see FURTHER INFORMATION sheet PCT/ISA/210
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 14,15

1. Dependent claims 14 and 15 are not clear (Article 6 PCT), because they do not disclose clear additional technical features. Moreover, claims 14 and 15 contain unnecessarily references to the drawings, contrary to Rule 6.2 PCT.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/GB 03/01928

| Patent document cited in search report | | Publication date | Patent family member(s) | Publication date |
|---|----|---------------------|----------------------------|---------------------|
| US 6192529 | B1 | 27-02-2001 | CA 2334188 A1 | 18-08-2001 |
| WO 9211484 | A | 09-07-1992 | SE 467675 B | 24-08-1992 |
| | | | SE 9004098 A | 22-06-1992 |
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| US 1502154 | A | 22-07-1924 | NONE | |
| DE 3807846 | A | 21-09-1989 | DE 3807846 A1 | 21-09-1989 |